FORM PTO-1390 US DEPARTMENT OF COMMERCE
REV. 5-93PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEYS DOCKET NUMBER
P02,0054

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)
10/070855

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/03080	**06 September 2000**	**08 September 1999**

TITLE OF INVENTION
METHOD FOR ASSESSING CHARGES FOR THE TRANSMISSION OF DATA IN PACKET-BASED COMMUNICATIONS NETWORKS

APPLICANT(S) FOR DO/EO/US
Uwe FOELL, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay.
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☒ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98; **(PTO 1449, Prior Art, Search Report, References)**.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included. **(SEE ATTACHED ENVELOPE)**
13. ☒ Preliminary Amendment A Prior to Action.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☒ A substitute specification and substitute specification mark-up.
15. ☐ A change of address letter attached to the Declaration.
16. ☒ Other items or information:
    a. ☒ Submission of Drawing Additions, 1 sheet of drawings, Figures 1-2.
    b. ☒ EXPRESS MAIL #EL 843745079 US dated March 8, 2002

U.S. APPLICATION NO. (if known, see 37 C.F.R. 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10/070855	PCT/DE00/03080	P02,0054

17. ☒ The following fees are submitted:	CALCULATIONS	PTO USE ONLY
BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5): Search Report has been prepared by the EPO or JPO $890 00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) $710.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R 1.445(a)(2) $740.00 Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2) paid to USPTO $1040.00 International preliminary examination fee paid to USPTO (37 C F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) $ 100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890.00	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).	$	

Claims	Number Filed		Number Extra	Rate		
Total Claims	08	- 20 =	0	X $ 18.00	$	
Independent Claims	02	- 3 =	0	X $ 84.00	$	
Multiple Dependent Claims				$280.00 +	$	
TOTAL OF ABOVE CALCULATIONS =					$ 890.00	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28)					$	
SUBTOTAL =					$ 890.00	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +					$	
TOTAL NATIONAL FEE =					$ 890.00	
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R 3.28, 3.31). $40.00 per property +						
TOTAL FEES ENCLOSED =					$ 890.00	
					Amount to be refunded	$
					charged	$

a. ☒ A check in the amount of $ 890.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **50-1519**. **A duplicate copy of this sheet is enclosed.**

NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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BOX PCT
IN THE UNITED STATES DESIGNATED/ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY--CHAPTER II

PRELIMINARY AMENDMENT A
PRIOR TO ACTION

APPLICANT(S): Uwe FOELL, et al.

ATTORNEY DOCKET NO.: P02,0054

INTERNATIONAL APPLICATION NO: PCT/DE00/03080

INTERNATIONAL FILING DATE: 06 September 2000

INVENTION: METHOD FOR ASSESSING CHARGES FOR THE TRANSMISSION OF DATA IN PACKET-BASED COMMUNICATIONS NETWORKS

Assistant Commissioner for Patents,
Washington D.C. 20231

Sir:

Applicants herewith amend the above-referenced PCT application, and request entry of the Amendment prior to examination on the United States Examination Phase.

IN THE CLAIMS:

On page 7:

replace line 1 with --WHAT IS CLAIMED IS:--;

Please cancel claims 1-8 without prejudice or disclaimer and add the following new claims 9-16.

9. A method for charging for transmitting data, comprising:

transmitting data as packet data via a first packet-based communications network;

transmitting the packet data via a second packet-based communications network, wherein the second packet-based communications network has a radio

interface used for transmitting packet data wirelessly from and to a mobile communications device;

setting up a communications link for data transmission between the first packet-based communications network, the second packet-based communications network and the mobile communications device if appropriate criteria are met;

charging for the data transmission utilizing a charging device which is associated with the second packet-based communications network;

controlling, with the charging device, the setup and clear-down of the communications link if the appropriate criteria are met; and

recording, with the charging device, a quantity associated with the data transmitted via the communications link.

10. The method as claimed in claim 9, further comprising:

identifying, with the charging device, a subscriber in the second packet-based communications network;

checking, with the charging device, an availability of access authorization for the subscriber; and

controlling the setup and clear-down of the communications link if access authorization is available.

11. The method as claimed in claim 9, wherein the appropriate criteria is the availability of defined parameters.

12. The method as claimed in claim 9, further comprising:

determining the quantity associated with the data transmitted by a volume of packet data transmitted; and

recording the quantity associated with the data transmission.

13. The method as claimed in claim 9, further comprising:

determining the quantity associated with the data transmitted by a duration of the communication link; and

recording the quantity associated with the data transmission.

14. The method as claimed in claim 9, further comprising:

determining the quantity associated with the data transmission by a number of communication links set up; and

recording the quantity associated with the data transmission.

15. A communications system for charging for a transmission of data, comprising:

a mobile communications device;

a packet-based communications network for transmitting at least some data as a packet data, the packet-based communications network comprising a radio interface to the mobile communications device;

a further packet-based communications network configured to provide a communications link between the packet-based communications network, the further packet-based communications network, and the mobile communications device; and

a charging device associated with the packet-based communications network configured to identify a subscriber in the packet-based communications network, to check an availability of access authorization for the subscriber, to control a setup and clear-down of a communications link if access authorization is available, and to record a quantity associated with data transmitted via the communications link.

16. The communications system for charging for the transmission of data according to claim 15, wherein the charging device comprises:

an access device arranged on an interface to the further packet-based communications network;

an access monitoring device configured to perform identification functions and access control functions;

a service unit configured to stipulate a type of charging; and

a counting device configured to record charge-related data.

REMARKS

The present Amendment revises the specification and claims to conform to United States patent practice, before examination of the present PCT application in the United States National Examination Phase. Pursuant to 37 CFR 1.125 (b), applicants have concurrently submitted a substitute specification, excluding the claims, and provided a marked-up copy. All of the changes are editorial and applicant believes no new matter is added thereby. The amendment, addition, and/or cancellation of claims is not intended to be a surrender of any of the subject matter of those claims.

Early examination on the merits is respectfully requested.

Submitted by,

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IN THE UNITED STATES DESIGNATED/ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY--CHAPTER II

SUBMISSION OF DRAWING ADDITIONS

APPLICANT(S):	Uwe FOELL, et al.
ATTORNEY DOCKET NO.:	P02,0054
INTERNATIONAL APPLICATION NO:	PCT/DE00/03080
INTERNATIONAL FILING DATE:	06 September 2000
INVENTION:	METHOD FOR ASSESSING CHARGES FOR THE TRANSMISSION OF DATA IN PACKET-BASED COMMUNICATIONS NETWORKS

Assistant Commissioner for Patents,
Washington, D.C. 20231

Sir:

Enclosed is a single sheet of drawings (Figures 1-2), showing in red, the addition of labels for the elements depicted therein for the above-referenced PCT application. Approval of the additions is respectfully requested.

Submitted by,

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(PRIOR ART)

FIG 1

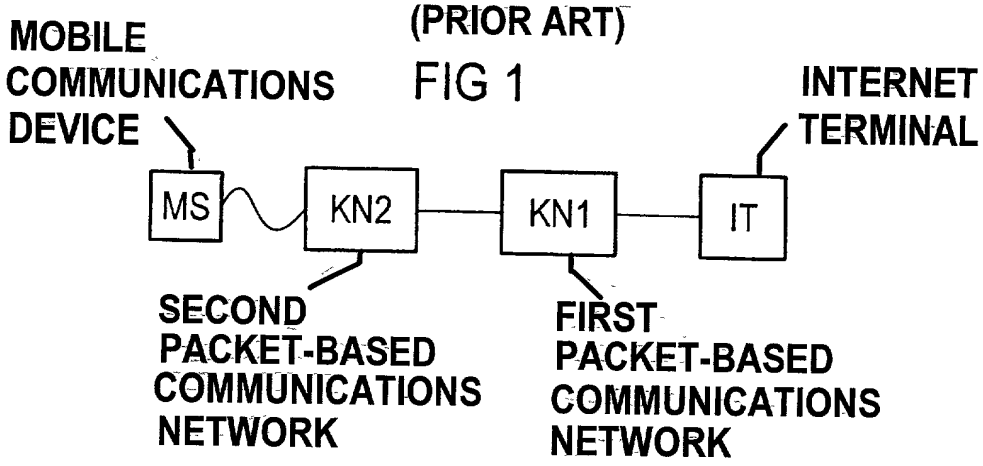
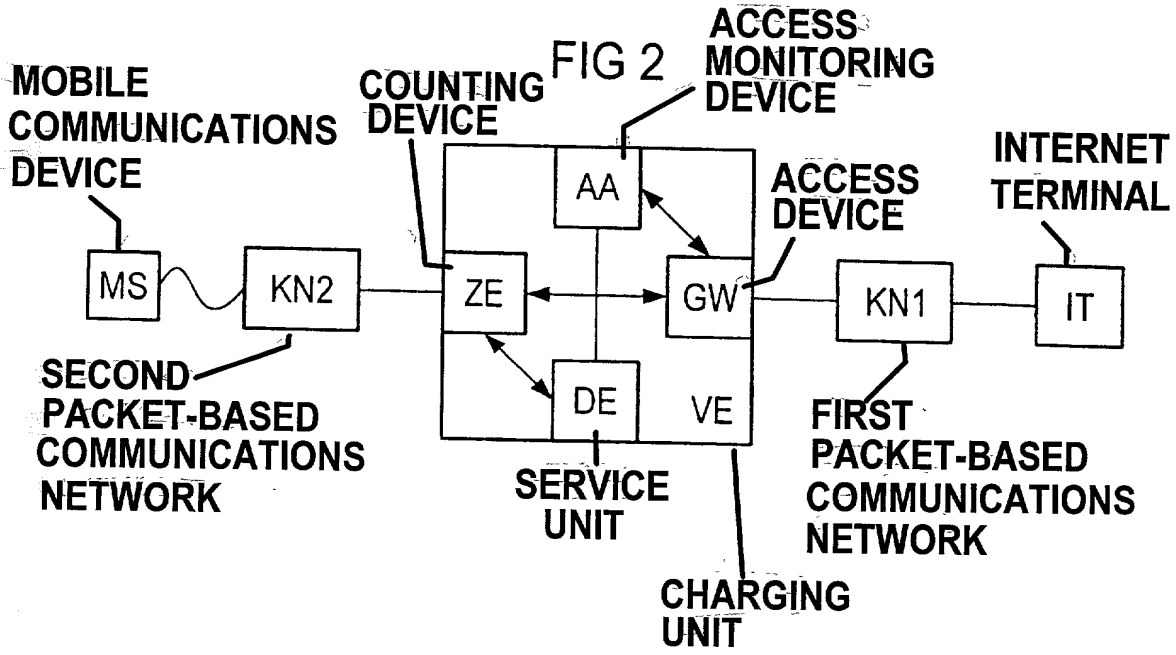


FIG 2



11prb

SPECIFICATION

TITLE

METHOD FOR CHARGING FOR THE TRANSMISSION OF DATA IN PACKET-BASED COMMUNICATIONS NETWORKS

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The invention relates to a method and a communications system for charging for the transmission of data between a first packet-based communications network, a second packet-based communications network and a mobile communications device.

DESCRIPTION OF THE RELATED ART

[0002] The transmission of packet data between packet-based communications networks, such as the Internet, and mobile communications devices, also called mobile stations below, is known generally. Both voice data and other multimedia data, such as image data and/or audio data, can be transmitted wirelessly from and to the mobile stations via a communications link.

[0003] Generally, the initiator of a communications link pays at least some of the incurred cost. In the case of data transmission between two mobile stations or else between a mobile station and the PSTN (Public Switched Telephone Network), there are generally agreements between the respective network operators regarding charging for the data traffic in order to cover costs.

[0004] However, if data are transmitted between a subscriber in a packet-based communications network, such as the Internet, and a mobile station, then the charges incurred by the Internet user as initiator of the connection – an "MTC" (Mobile Terminating Call) – are generally made up of the charges from the service provider (e.g. Internet provider) and the charges for dialing up the service provider's Internet server, for example via the PSTN. In this case, the Internet user incurs no special charges for the data transmission to a mobile station, which means that the cost charged to the Internet user as the initiator of the connection always remains the same irrespective of the recipient of the data and the type of data transmission.

[0005] In particular, the operator of a packet-based mobile radio network has no way of getting a subscriber in another packet-based communications network, e.g., an Internet user, to share the cost of an MTC.

SUMMARY OF THE INVENTION

[0006] The invention is therefore based on the object of specifying a method and a communications system for charging for the transmission of data which allow a subscriber in a packet-based communications network to be charged in the case of an MTC.

[0007] This object is achieved by a method for charging for transmitting data, comprising transmitting data as packet data via a first packet-based communications network; transmitting the packet data via a second packet-based communications network, wherein the second packet-based communications network has a radio interface used for transmitting packet data wirelessly from and to a mobile communications device; setting up a communications link for data transmission between the first packet-based communications network, the second packet-based communications network and the mobile communications device if appropriate criteria are met; charging for the data transmission utilizing a charging device which is associated with the second packet-based communications network; controlling, with the charging device, the setup and clear-down of the communications link if the appropriate criteria are met; and recording, with the charging device, a quantity associated with the data transmitted via the communications link.

[0008] This object is also achieved by a communications system for charging for a transmission of data, comprising a mobile communications device; a packet-based communications network for transmitting at least some data as a packet data, the packet-based communications network comprising a radio interface to the mobile communications device; a further packet-based communications network configured to provide a communications link between the packet-based communications network, the further packet-based communications network, and the mobile communications device; and a charging device associated with the packet-based communications network configured to identify a subscriber in the packet-based communications network, to check an availability of access authorization for the subscriber, to control a setup and clear-down of a communications link if access

authorization is available, and to record a quantity associated with data transmitted via the communications link.

[0009] In the invention, charging for the data transmission is effected by at least one charging device which is associated with a second packet-based communications network and which controls the setup and clear-down of at least one communications link for data transmission between a first packet-based communications network, the second packet-based communications network, and at least one mobile communications device and records the quantity of data transmitted via the at least one communications link.

[0010] The advantage of the invention is that the operator of a second communications network (for example, a mobile radio operator) can monitor the transmission of data from a subscriber in a first packet based communications network (for example an Internet user) to a mobile station. On the basis of the recorded quantity of data transmitted, the subscriber can use any desired charging method for the use of the communications link. It is thus conceivable, for example, to record the volume of data transmitted, the type of data transmitted, the bandwidth of the communications link and the number or else the duration of the respective communications links in the course of quantitative recording, and to use these as the basis of calculation for charging. In this context, it is possible both to use the same methods of calculation for each subscriber and to use different methods of calculation according to subscriber.

[0011] On the basis of one development of the inventive concept, the identification of the subscriber, the checking of his access authorization and the dependency of the setup and clear-down of the communications link on the availability of access authorization provides the operator of a mobile radio network with the option of making the mobile radio network available only to selected subscribers, for example.

DESCRIPTION OF THE DRAWINGS

[0012] The invention is explained in more detail below using an exemplary embodiment illustrated in the drawings.

Figure 1 is a block diagram of the basic design of a communications system for transmitting packet data based on the prior art, and

Figure 2 is a block diagram of the design of the communications system with an inventive charging device.

DETAILED DESCRIPTION OF THE INVENTION

[0013] Figure 1 is an exemplary illustration of the design of a communications system based on the prior art. A subscriber, who is connected to a first packet-based communications network KN1 via an Internet terminal IT (or via another suitable device), or a subscriber who can be connected permanently to the first communications network KN1, can set up a communications link to a mobile communications device MS via a second packet-based communications network KN2.

[0014] In this case, the second packet-based communications network KN2, e.g., a packet based mobile radio network, is connected to the first communications network KN1 via a suitable interface (not shown). The second communications network KN2 is for its part connected to the mobile communications device MS via a radio interface for wireless data transmission.

[0015] For data transmission to a mobile station MS, the subscriber pays an Internet provider charges which can be calculated, by way of example, according to the volume of data transmitted, according to the duration of the connection, or possibly by making a flat rate payment. When the subscriber on the Internet terminal IT dials up an Internet server for the Internet provider, for example, using the PSTN (Public Switched Telephone Network), he additionally incurs telephone costs. These costs are dependent only on the communications link between the Internet terminal IT and the first packet-based communications network KN1, however. The type of data transmission from the first packet-based communications network KN1 to the second packet-based communications network KN2 and to the mobile station MS has no effect on the cost incurred by the initiator of the connection. In particular, the initiator of the connection is not charged the higher cost for wireless transmission of the packet data.

[0016] To allow charging for the data transmission for an MTC (Mobile Terminating Call), the second packet-based communications network KN2 can be assigned a charging unit VE, as shown in Figure 2.

[0017] By way of example, the charging device VE can have the following elements:

- an access device GW which is arranged on the interface to the first packet-based communications network KN1, e.g. the Internet,
- an access monitoring device AA which performs identification functions and access control functions,
- a service unit DE which stipulates the type of charging (e.g. credit card, invoice, etc.), and
- a counting device ZE which records the charge-related data, such as number of data packets, duration of the communications link etc.

[0018] To set up a communications link from the first communications network KN1 to a mobile station MS (Mobile Terminating Call, MTC), the access device GW sends a request to the access monitoring device AA. The access monitoring device AA identifies the subscriber and checks his authorization for initiating a communications link.

[0019] The subscriber and his associated or his chosen method of charging may be known to the access monitoring device AA by virtue of a registration procedure. If the subscriber is still unknown to the access monitoring device AA, he can register with it and can specify the type of charging (e.g., credit card, collection via his telephone bill, billing the charges via the Internet service provider bill). The subscriber's access authorization can relate to all types of communications links or else just to some of the possible communications links.

[0020] If the authorization is available, the access monitoring device AA begins a dialog with the service unit DE and in so doing stipulates the charging functions to be performed on the basis of the subscriber's type of charging.

[0021] In this context, the initiator of the connection can use a credit card or else a debit card (prepaid), for which he has already paid the charges in advance, e.g., to the operator of the second communications network KN2. It is also possible for the subscriber to pay a flat rate payment for the communications links he initiates. Furthermore, charging can be distinguished on the basis of the type of communications link (e.g., bandwidth, Quality of Service, transmission of voice data or other data).

[0022] The charge-related data can be recorded by a counting device ZE which, to this end, is activated by the service unit DE and transmits the recorded data to the service unit DE. This function can also be performed by the access device GW. The service unit DE can manage a subscriber credit account online and can reduce it by the incurred charges (prepaid) or can provide charge records for the subsequent processing of charges, e.g., to the operator of the second communications network KN2.

[0023] If the subscriber is no longer authorized to use a communications link, e.g., because the credit facility having been exhausted or because the debit card having expired, the access device GW can prompt a clear-down of the communications link.

[0024] No limitation of the scope of the invention is intended by this specific language, and the invention should be construed to encompass all embodiments that would normally occur to one of ordinary skill in the art.

[0025] The present invention may be described in terms of functional block components and various processing steps. Such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, where the elements of the present invention are implemented using software programming or software elements the invention may be implemented with any programming or scripting language, with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Furthermore, the present invention could employ any number of conventional techniques for electronics configuration, signal processing and/or control, data processing and the like.

[0026] The particular implementations shown and described herein are illustrative examples of the invention and are not intended to otherwise limit the scope of the invention in any way. For the sake of brevity, conventional electronics, control systems, software development and other functional aspects of the systems (and components of the individual operating components of the systems) may not be

described in detail. Furthermore, the connecting lines, or connectors shown in the various figures presented are intended to represent exemplary functional relationships and/or physical or logical couplings between the various elements. It should be noted that many alternative or additional functional relationships, physical connections or logical connections may be present in a practical device. Moreover, no item or component is essential to the practice of the invention unless the element is specifically described as "essential" or "critical". Thus, numerous modifications and adaptations will be readily apparent to those skilled in this art without departing from the spirit and scope of the present invention.

ABSTRACT

The invention relates to a method and a communications system for charging for the transmission of data, having a first packet-based communications network, a second packet-based communications network and a mobile communications device. On the basis of the subject matter of the invention, the second packet-based communications network has at least one radio interface used for transmitting the packet data wirelessly from and to the mobile communications device. Charging for the data transmission is effected by at least one charging device which is associated with the second packet-based communications network and which controls the setup and clear-down of at least one communications link between the first packet-based communications network, the second packet-based communications network and at least one mobile communications device and records the quantity of data transmitted via the at least one communications link.

[~~Description~~]**SPECIFICATION**

[~~Method for charging for the transmission of data in packet-based communications networks~~]

TITLE

METHOD FOR CHARGING FOR THE TRANSMISSION OF DATA IN PACKET-BASED COMMUNICATIONS NETWORKS

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The invention relates to a method and a communications system for charging for the transmission of data between a first packet-based communications network, a second packet-based communications network and a mobile communications device.

DESCRIPTION OF THE RELATED ART

The transmission of packet data between packet-based communications networks, such as the Internet, and mobile communications devices, also called mobile stations below, is known generally. Both voice data and other multimedia data, such as image data and/or audio data, can be transmitted wirelessly from and to the mobile stations via a communications link.

Generally, the initiator of a communications link pays at least some of the incurred cost. In the case of data transmission between two mobile stations or else between **a** mobile station and **the** PSTN (Public Switched Telephone Network), there are generally agreements between the respective network operators regarding charging for the data traffic in order to cover [~~cost~~]**costs**.

However, if data are transmitted between a subscriber in a packet-based communications network, such as the Internet, and a mobile station, then the charges incurred by the Internet user as initiator of the connection – an "MTC" (Mobile Terminating Call) – are generally made up of the charges from the service provider (e.g. Internet provider) and the charges for dialing up the service provider's Internet server, for example via the PSTN. In this case, the Internet user incurs no special charges for the data transmission to a mobile station,

which means that the cost charged to the Internet user as the initiator of the connection always remains the same irrespective of the recipient of the data and the type of data transmission.

[~~which means that the cost charged to the Internet user as~~][~~initiator of the connection always remains the same irrespective of the recipient of the data and the type of data transmission.~~]

]In particular, the operator of a packet-based mobile radio network has no way of getting a subscriber in another packet-based communications network, e.g., an Internet user, to share the cost of an MTC.

SUMMARY OF THE INVENTION

The invention is therefore based on the object of specifying a method and a communications system for charging for the transmission of data which allow a subscriber in a packet-based communications network to be charged in the case of an MTC.

This object is achieved by [~~the method having the features of claim 1 and by the communications system having the features of claim 7. Advantageous developments of the invention can be found in the subclaims.~~]**a method for charging for transmitting data, comprising transmitting data as packet data via a first packet-based communications network; transmitting the packet data via a second packet-based communications network, wherein the second packet-based communications network has a radio interface used for transmitting packet data wirelessly from and to a mobile communications device; setting up a communications link for data transmission between the first packet-based communications network, the second packet-based communications network and the mobile communications device if appropriate criteria are met; charging for the data transmission utilizing a charging device which is associated with the second packet-based communications network; controlling, with the charging device, the setup and clear-down of the communications link if the appropriate criteria are met; and recording, with the charging device, a quantity associated with the data transmitted via the communications link.**

This object is also achieved by a communications system for charging for a transmission of data, comprising a mobile communications device; a packet-based communications network for transmitting at least some data as a packet data, the packet-based communications network comprising a radio interface to the mobile communications device; a further packet-based communications network configured to provide a communications link between the packet-based communications network, the further packet-based communications network, and the mobile communications device; and a charging device associated with the packet-based communications network configured to identify a subscriber in the packet-based communications network, to check an availability of access authorization for the subscriber, to control a setup and clear-down of a communications link if access authorization is available, and to record a quantity associated with data transmitted via the communications link.

[~~On the basis of the subject matter of~~]**In** the invention, charging for the data transmission is effected by at least one charging device which is associated with a second packet-based communications network and which controls the setup and clear-down of at least one communications link for data transmission between a first packet-based communications network, the second packet-based communications network, and at least one mobile communications device and records the quantity of data transmitted via the at least one communications link.

[~~The advantage of the invention is that the operator of a second communications network~~][~~, for example a mobile radio operator,~~][~~ can monitor the transmission of data from a subscriber in a first packet based communications network~~][~~,~~][~~for example an Internet user~~][~~, to a mobile station.~~][~~On the basis of the recorded quantity of data transmitted, ~~][~~he~~][~~ can use any desired charging method for the use~~]

]**The advantage of the invention is that the operator of a second communications network**~~, for example a mobile radio operator,~~ **(for example, a mobile radio operator) can monitor the transmission of data from a subscriber in a first packet based communications network**~~,~~ **(for example an Internet user**~~, to a mobile station.~~**) to a mobile station. On the basis of the recorded quantity of data transmitted,** ~~he~~**the subscriber can use any**

desired charging method for the use of the communications link. It is thus conceivable, for example, to record the volume of data transmitted, the type of data transmitted, the bandwidth of the communications link and the number or else the duration of the respective communications links in the course of quantitative recording, and to use these as the basis of calculation for charging. In this context, it is possible both to use the same methods of calculation for each subscriber and to use different methods of calculation according to subscriber.

On the basis of one development of the inventive concept, the identification of the subscriber, the checking of his access authorization and the dependency of the setup and clear-down of the communications link on the availability of access authorization provides the operator of a mobile radio network with the option of making the mobile radio network available only to selected subscribers, for example.

DESCRIPTION OF THE DRAWINGS

The invention is explained in more detail below using an exemplary embodiment illustrated in the [~~drawing, in which~~]**drawings.**

[~~figure~~]**Figure** 1 [~~shows~~]**is** a block diagram of the basic design of a communications system for transmitting packet data based on the prior art, and

[~~figure~~]**Figure** [~~2~~]**2** [~~shows~~]**is a block diagram of** the design of the communications system with an inventive charging device.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 is an exemplary illustration of the design of a communications system based on the prior art. A subscriber, who is connected to a first packet-based communications network KN1 via an Internet terminal IT (or via another suitable device), or [~~else~~]**a subscriber** who can be connected permanently to the first communications network KN1, can set up a communications link to a mobile communications device MS via a second packet-based communications network KN2.

In this case, the second packet-based communications network KN2, e.g., a packet based mobile radio network, is connected to the first communications network KN1 via a suitable interface (not shown). The second communications

network KN2 is for its part connected to the mobile communications device MS via a radio interface for wireless data transmission.

For data transmission to a mobile station MS, the subscriber pays an Internet provider charges which can be calculated, by way of example, according to the volume of data transmitted[~~, or~~], according to the duration of the connection, or [~~he pays~~]**possibly by making** a flat rate payment. When the subscriber on the Internet terminal IT dials up an Internet server for the Internet provider, for example, using the PSTN (Public Switched Telephone Network), he additionally incurs telephone costs. These costs are dependent only on the communications link between the Internet terminal IT and the first packet-based communications network KN1, however. The type of data transmission from the first packet-based communications network KN1 to the second packet-based communications network KN2 and to the mobile station MS has no effect on the cost incurred by the initiator of the connection. In particular, the initiator of the connection is not charged the higher cost for wireless transmission of the packet data.

To allow charging for the data transmission for an MTC (Mobile Terminating Call), the second packet-based communications network KN2 can be assigned a charging unit VE, as shown in [~~figure~~]**Figure** 2.

By way of example, the charging device VE can have the following elements:

[—]an access device GW which is arranged on the interface to the first packet-based communications network KN1, e.g. the Internet,
[—]an access monitoring device AA which performs identification functions and access control functions,
[—]a service unit DE which stipulates the type of charging (e.g. credit card, invoice, etc.), and
[—]a counting device ZE which records the charge-related data, such as number of data packets, duration of the communications link etc.
To set up a communications link from the first communications network KN1 to a mobile station MS (Mobile Terminating Call, MTC), the access device GW sends a request to the access monitoring device AA. The access monitoring device AA identifies the subscriber and checks his authorization for initiating a communications link.

The subscriber and his associated or his chosen method of charging may be known to the access monitoring device AA by virtue of a registration procedure. If the subscriber is still unknown to the access monitoring device AA, he can register with it and can specify the type of charging (e.g., credit card, collection via his telephone bill, billing the charges via the Internet service provider bill). The subscriber's access authorization can relate to all types of communications links or else just to some of the possible communications links.

If the authorization is available, the access monitoring device AA begins a dialog with the service unit DE and in so doing stipulates the charging functions to be performed on the basis of the subscriber's type of charging.

[~~In this context, the initiator of the connection can use a credit card or else a debit card (prepaid), for which he has already paid the charges in advance, e.g.~~][~~ to the operator of the second communications network KN2. It is also~~]
]**In this context, the initiator of the connection can use a credit card or else a debit card (prepaid), for which he has already paid the charges in advance, e.g., to the operator of the second communications network KN2. It is also** possible for the subscriber to pay a flat rate payment for the communications links he initiates. Furthermore, charging can be distinguished on the basis of the type of communications link (e.g., bandwidth, Quality of Service, transmission of voice data or other data).

The charge-related data can be recorded by a counting device ZE which, to this end, is activated by the service unit DE and transmits the recorded data to the service unit DE. This function can also be performed by the access device GW. The service unit DE can manage a subscriber credit account online and can reduce it by the incurred charges (prepaid) or can provide charge records for the subsequent processing of charges, e.g., to the operator of the second communications network KN2.

If the subscriber is no longer authorized to use a communications link, e.g.[~~ on account of~~]**, because** the credit facility having been exhausted or [~~on account of~~]**because** the debit card having expired, the access device GW can prompt **a** clear-down of the communications link.

No limitation of the scope of the invention is intended by this specific language, and the invention should be construed to encompass all embodiments that would normally occur to one of ordinary skill in the art.

The present invention may be described in terms of functional block components and various processing steps. Such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, where the elements of the present invention are implemented using software programming or software elements the invention may be implemented with any programming or scripting language, with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Furthermore, the present invention could employ any number of conventional techniques for electronics configuration, signal processing and/or control, data processing and the like.

The particular implementations shown and described herein are illustrative examples of the invention and are not intended to otherwise limit the scope of the invention in any way. For the sake of brevity, conventional electronics, control systems, software development and other functional aspects of the systems (and components of the individual operating components of the systems) may not be described in detail. Furthermore, the connecting lines, or connectors shown in the various figures presented are intended to represent exemplary functional relationships and/or physical or logical couplings between the various elements. It should be noted that many alternative or additional functional relationships, physical connections or logical connections may be present in a practical device. Moreover, no item or component is essential to the practice of the invention unless the element is specifically described as "essential" or "critical". Thus, numerous modifications and adaptations will be readily

<u>apparent to those skilled in this art without departing from the spirit and scope of the present invention.</u>

[~~Abstract~~]

[~~Method for charging for the transmission of data in packet-based communications networks~~]**ABSTRACT**

The invention relates to a method and a communications system for charging for the transmission of data, having a first packet-based communications network[~~(KN1)~~], a second packet-based communications network [~~(KN2)~~]and a mobile communications device[~~(MS)~~]. On the basis of the subject matter of the invention, the second packet-based communications network [~~(KN2)~~]has at least one radio interface used for transmitting the packet data wirelessly from and to the mobile communications device[~~(MS)~~]. Charging for the data transmission is effected by at least one charging device [~~(VE)~~]which is associated with the second packet-based communications network [~~(KN2)~~]and which controls the setup and clear-down of at least one communications link between the first packet-based communications network[~~(KN1)~~], the second packet-based communications network [~~(KN2)~~]and at least one mobile communications device[~~(MS)~~] and records the quantity of data transmitted via the at least one communications link.

[~~Figure 2~~]

Description

Method for charging for the transmission of data in packet-based communications networks

The invention relates to a method and a communications system for charging for the transmission of data between a first packet-based communications network, a second packet-based communications network and a mobile communications device.

The transmission of packet data between packet-based communications networks, such as the Internet, and mobile communications devices, also called mobile stations below, is known generally. Both voice data and other multimedia data, such as image data and/or audio data, can be transmitted wirelessly from and to the mobile stations via a communications link.

Generally, the initiator of a communications link pays at least some of the incurred cost. In the case of data transmission between two mobile stations or else between mobile station and PSTN (Public Switched Telephone Network), there are generally agreements between the respective network operators regarding charging for the data traffic in order to cover cost.

However, if data are transmitted between a subscriber in a packet-based communications network, such as the Internet, and a mobile station, then the charges incurred by the Internet user as initiator of the connection - an "MTC" (Mobile Terminating Call) - are generally made up of the charges from the service provider (e.g. Internet provider) and the charges for dialing up the service provider's Internet server, for example via the PSTN. In this case, the Internet user incurs no special charges for the data transmission to a mobile station,

which means that the cost charged to the Internet user as initiator of the connection always remains the same irrespective of the recipient of the data and the type of data transmission.

In particular, the operator of a packet-based mobile radio network has no way of getting a subscriber in another packet-based communications network, e.g. an Internet user, to share the cost of an MTC.

The invention is therefore based on the object of specifying a method and a communications system for charging for the transmission of data which allow a subscriber in a packet-based communications network to be charged in the case of an MTC.

This object is achieved by the method having the features of claim 1 and by the communications system having the features of claim 7. Advantageous developments of the invention can be found in the subclaims.

On the basis of the subject matter of the invention, charging for the data transmission is effected by at least one charging device which is associated with a second packet-based communications network and which controls the setup and clear-down of at least one communications link for data transmission between a first packet-based communications network, the second packet-based communications network and at least one mobile communications device and records the quantity of data transmitted via the at least one communications link.

The advantage of the invention is that the operator of a second communications network, for example a mobile radio operator, can monitor the transmission of data from a subscriber in a first packet based

communications network, for example an Internet user, to a mobile station. On the basis of the recorded quantity of data transmitted, he can use any desired charging method for the use

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of the communications link. It is thus conceivable, for example, to record the volume of data transmitted, the type of data transmitted, the bandwidth of the communications link and the number or else the duration of the respective communications links in the course of quantitative recording, and to use these as the basis of calculation for charging. In this context, it is possible both to use the same methods of calculation for each subscriber and to use different methods of calculation according to subscriber.

On the basis of one development of the inventive concept, the identification of the subscriber, the checking of his access authorization and the dependency of the setup and clear-down of the communications link on the availability of access authorization provides the operator of a mobile radio network with the option of making the mobile radio network available only to selected subscribers, for example.

The invention is explained in more detail below using an exemplary embodiment illustrated in the drawing, in which

figure 1 shows a block diagram of the basic design of a communications system for transmitting packet data based on the prior art, and

figure 2 shows the design of the communications system with an inventive charging device.

Figure 1 is an exemplary illustration of the design of a communications system based on the prior art. A subscriber, who is connected to a first packet-based communications network KN1 via an Internet terminal IT or via another suitable device or else who can be connected permanently to the first communications network KN1, can set up a communications link to a mobile communications device MS via a second packet-

based communications network KN2.

In this case, the second packet-based communications network KN2, e.g. a packet based mobile radio network, is connected to the first communications network KN1 via a suitable interface (not shown). The second communications network KN2 is for its part connected to the mobile communications device MS via a radio interface for wireless data transmission.

For data transmission to a mobile station MS, the subscriber pays an Internet provider charges which can be calculated, by way of example, according to the volume of data transmitted or according to the duration of the connection, or he pays a flat rate payment. When the subscriber on the Internet terminal IT dials up an Internet server for the Internet provider, for example using the PSTN (Public Switched Telephone Network), he additionally incurs telephone costs. These costs are dependent only on the communications link between the Internet terminal IT and the first packet-based communications network KN1, however. The type of data transmission from the first packet-based communications network KN1 to the second packet-based communications network KN2 and to the mobile station MS has no effect on the cost incurred by the initiator of the connection. In particular, the initiator of the connection is not charged the higher cost for wireless transmission of the packet data.

To allow charging for the data transmission for an MTC (Mobile Terminating Call), the second packet-based communications network KN2 can be assigned a charging unit VE, as shown in figure 2.

By way of example, the charging device VE can have the following elements:

- an access device GW which is arranged on the interface to the first packet-based communications network KN1, e.g. the Internet,

- an access monitoring device AA which performs identification functions and access control functions,
- a service unit DE which stipulates the type of charging (e.g. credit card, invoice, etc.), and
- a counting device ZE which records the charge-related data, such as number of data packets, duration of the communications link etc.

To set up a communications link from the first communications network KN1 to a mobile station MS (Mobile Terminating Call, MTC), the access device GW sends a request to the access monitoring device AA. The access monitoring device AA identifies the subscriber and checks his authorization for initiating a communications link.

The subscriber and his associated or his chosen method of charging may be known to the access monitoring device AA by virtue of a registration procedure. If the subscriber is still unknown to the access monitoring device AA, he can register with it and can specify the type of charging (e.g. credit card, collection via his telephone bill, billing the charges via the Internet service provider bill). The subscriber's access authorization can relate to all types of communications links or else just to some of the possible communications links.

If the authorization is available, the access monitoring device AA begins a dialog with the service unit DE and in so doing stipulates the charging functions to be performed on the basis of the subscriber's type of charging.

In this context, the initiator of the connection can use a credit card or else a debit card (prepaid), for which he has already paid the charges in advance, e.g.

to the operator of the second communications network KN2. It is also

possible for the subscriber to pay a flat rate payment for the communications links he initiates. Furthermore, charging can be distinguished on the basis of the type of communications link (e.g. bandwidth, Quality of Service, transmission of voice data or other data).

The charge-related data can be recorded by a counting device ZE which, to this end, is activated by the service unit DE and transmits the recorded data to the service unit DE. This function can also be performed by the access device GW. The service unit DE can manage a subscriber credit account online and can reduce it by the incurred charges (prepaid) or can provide charge records for the subsequent processing of charges, e.g. to the operator of the second communications network KN2.

If the subscriber is no longer authorized to use a communications link, e.g. on account of the credit facility having been exhausted or on account of the debit card having expired, the access device GW can prompt clear-down of the communications link.

Patent claims

1. A method for charging for the transmission of data, where

- data are transmitted as packet data via at least one section of a first packet-based communications network (KN1),
- the packet data are transmitted via at least one section of a second packet-based communications network (KN2),
- the second packet-based communications network (KN2) has at least one radio interface used for transmitting the packet data wirelessly from and to a mobile communications device (MS),
- at least one communications link can be set up for data transmission between the first packet-based communications network (KN1), the second packet-based communications network (KN2) and at least one mobile communications device (MS), and
- charging for the data transmission is effected by at least one charging device (VE) which is associated with the second packet-based communications network (KN2) and which
- controls the setup and clear-down of at least one communications link and
- records the quantity of data transmitted via the at least one communications link.

2. The method as claimed in claim 1, where the charging device (VE)

- identifies a subscriber in the second packet-based communications network (KN2),
- checks the availability of access authorization for the subscriber,
- controls the setup and clear-down of at least one communications link if access authorization is available.

3. The method as claimed in claim 1 or 2, where the at least one communications link is set up and/or cleared down if defined parameters are available.

4. The method as claimed in one of the preceding claims, where the quantity of data transmitted via the at least one communications link is recorded by determining the volume of packet data transmitted.

5. The method as claimed in one of the preceding claims, where the quantity of data transmitted via the at least one communications link is recorded by determining the duration of the communications link.

6. The method as claimed in one of the preceding claims, where the quantity of data transmitted via the at least one communications link is recorded by determining the number of communications links set up.

7. A communications system for charging for the transmission of data, having

- a packet-based communications network (KN2) for transmitting at least some of the data as packet data, where the packet-based communications network (KN2) has at least one radio interface to at least one mobile communications device (MS),
- at least one communications link which can be set up between the packet-based communications network (KN2), a further packet-based communications network (KN1) and the at least one mobile communications device (MS), and
- a charging device (VE), associated with the packet-based communications network (KN2), for identifying a subscriber in the packet-based communications network (KN2), for checking the availability of access authorization for the subscriber, for controlling the setup and clear-down of at least one communications link if access

authorization is available, and for recording the quantity of data transmitted via the at least one communications link.

8. The communications system for charging for the transmission of data as claimed in claim 7, where the charging unit (VE) has the following elements:

- an access device (GW) which is arranged on the interface to the further packet-based communications network (KN1),
- an access monitoring device (AA) for performing identification functions and access control functions,
- a service unit (DE) for stipulating the type of charging, and
- a counting device (ZE) for recording the charge-related data.

GR 99 P 2776

Abstract

Method for charging for the transmission of data in packet-based communications networks

The invention relates to a method and a communications system for charging for the transmission of data, having a first packet-based communications network (KN1), a second packet-based communications network (KN2) and a mobile communications device (MS). On the basis of the subject matter of the invention, the second packet-based communications network (KN2) has at least one radio interface used for transmitting the packet data wirelessly from and to the mobile communications device (MS). Charging for the data transmission is effected by at least one charging device (VE) which is associated with the second packet-based communications network (KN2) and which controls the setup and clear-down of at least one communications link between the first packet-based communications network (KN1), the second packet-based communications network (KN2) and at least one mobile communications device (MS) and records the quantity of data transmitted via the at least one communications link.

Figure 2

FIG 1

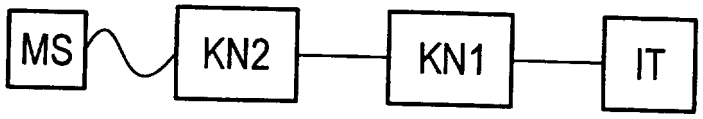
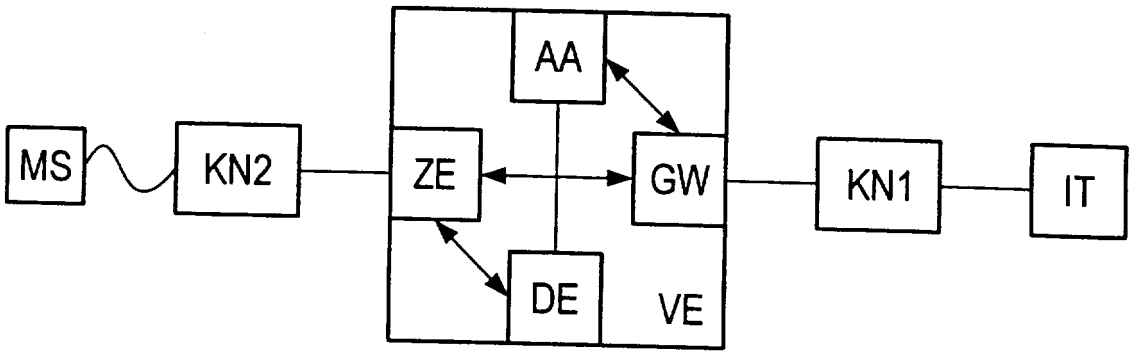


FIG 2



Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

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My residence, post office address and citizenship are as stated below next to my name,

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I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Verfahren zur Vergebührung der Übertragung von Daten in paketbasierten Kommunikationsnetzen

Method for assessing charges for the transmission of data in packet-based communications networks

deren Beschreibung

(zutreffendes ankreuzen)
☐ hier beigefügt ist.
☒ am 06.09.2000 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE00/03080
eingereicht wurde und am ________
abgeändert wurde (falls tatsächlich abgeändert).

the specification of which

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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

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I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed	
19942947.2	DE	08.09.1999	☒	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.) (Anmeldeseriennummer)	(Filing Date D, M, Y) (Anmeldedatum T, M, J)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)
PCT/DE00/03080	06.09.2000	anhängig	pending
_____	_____	_____	_____

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Voller Name des einzigen oder ursprünglichen Erfinders: Uwe Foell	Full name of sole or first inventor: Uwe Foell
Unterschrift des Erfinders Datum Uwe Foell 28.01.02	Inventor's signature Date
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Postanschrift Kieler Str. 2 14612 Falkensee	Post Office Addess Kieler Str. 2 14612 Falkensee
Voller Name des zweiten Miterfinders (falls zutreffend): WOLFGANG HAHN	Full name of second joint inventor, if any: WOLFGANG HAHN
Unterschrift des Erfinders Datum Wolfgang Hahn 28.01.02	Second Inventor's signature Date
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Staatsangehörigkeit DE	Citizenship DE
Postanschrift LINDENALLEE 11 16562 BERGFELDE GERMANY	Post Office Address LINDENALLEE 11 16562 BERGFELDE GERMANY

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(Supply similar information and signature for third and subsequent joint inventors).